Amendments to the drawings,

Please amend the Drawings, as shown in the attached Replacement for Sheet #5.

Remarks

<u>Status of application</u>

        Claims 1-55 were examined and stand rejected in view of prior art. The claims have been amended to further clarify Applicant's invention. Reexamination and reconsideration are respectfully requested.

<u>The invention</u>

        Applicant's invention comprises a system with methodology for performing relational operations over a combination of relational data (e.g., data stored in a local database) and data retrieved from a web service. The solution enables data retrieved from a web service (e.g., retrieved using Simple Object Access Protocol (SOAP) operations) to be automatically and transparently mapped into a relational database system, thereby allowing relational operations to be performed over the data.

        Applicant's invention provides for representing methods of web services as proxy tables in the database system. When a database operation (e.g., a query submitted by a user) is performed on a proxy table representing a method of a web service, Applicant's invention automatically and transparently performs the appropriate steps to interact with the web service, retrieve data from the web service and convert the retrieved data for use at the database system. This enables relational operations to be performed on the data retrieved from the web service. Significantly, relational operations may be performed on data retrieved from the web service as well as data stored in the database system. A user may, for instance, utilize this capability to integrate data from an enterprise resource planning (ERP) system which is available as a web service with data stored in a local database system. For example, the user may submit a query including a JOIN condition on data that is stored in both the ERP system and the local database system and in response receive a result set including data obtained from both systems.

<u>General</u>

        A. Drawings correction

        Replacement Sheet #5 is filed herewith, in order to correct the reference numeral

error.

B. Section 101 Rejection

Claims 1-39 stand rejected under 35 U.S.C. 101 on the basis of non-statutory subject matter. Here, the Examiner rejects the claiming of performing database operations on data obtained from a web service without indicating what useful, concrete and tangible result is obtained. Applicant has amended independent claims 1 and 22 to better clarify the useful results obtained through use Applicant's claimed invention. Applicant's amended claims provide that the data obtained from the web service is used to generate a result set which is returned in response to the database operation (e.g., query). It is respectfully submitted that this is a useful, concrete and patentable advance over the art. In view of the above-mentioned amendments, it is respectfully submitted that the rejection under Section 101 is overcome.

Prior art rejections

A. First Section 103 Rejection: Bata and Omoigui

Claims 1-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,799,182 to Bata (hereafter Bata) in view of US PGPub 2003/0126136 to Omoigui (hereafter Omoigui). The Examiner's rejection of claim 1 is representative:

> Referring to claim 1, Bata teaches a method for performing database operations on data obtained from a web service. In particular, Bata teaches a method for performing database operations on data obtained from a web service (see abstract and column 4, lines 42-46), the method comprising:
>
> creating at least one proxy table in a database, each proxy table mapping to a method of the web service (see column 5, lines 31-34 and column 9, lines 6-34 - the purchase order is stored in a database, which was generated from the input XML document);
>
> in response to a database operation on a particular proxy table, converting the database operation into a format for invoking a particular method of the web service based upon the corresponding mapping (see column 7, lines 35-43);
>
> invoking the particular method of the web service (see column 10, lines 10-16

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- the data is inserted);

converting results obtained from invoking the particular method into data for use at the database based upon the corresponding mapping (see column 7, lines 44-46); and

performing the database operation on the data at the database (see column 9, lines 58-65 - the operation is a join operation to create the database).

However, while Bata discloses a method for performing database operations on data obtained from a web service, Bata fails to explicitly teach the further limitation of performing the database operation on the data at the database. Omoigui teaches a similar method to that of Bata, including performing database operations on data (see [0498]-[0506]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Omoigui method of performing operations on the database created by Bata. One would have been motivated to do so in order to provide results from queries to a user.

Under Section 103(a), a patent may not be obtained if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. To establish a prima facie case of obviousness under this section, the Examiner must establish: (1) that there is some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, (2) that there is a reasonable expectation of success, and (3) that the prior art reference (or references when combined) must teach or suggest all the claim limitations. (See e.g., MPEP 2142). As will be shown below, the Bata and Omoigui references, even when combined, fail to meet the requisite condition of teaching or suggesting all of Applicant's claim limitations.

Bata's system provides for receiving and parsing documents in XML format so as to convert data from these documents into a format that can be stored in a database. As shown at Fig. 8, Bata starts with the receipt of a document in XML format (e.g., a purchase order from a trading partner) for conversion (Bata Fig. 8, column 8, line 64 to column 9, line 5). After the document is received, Bata's system parses the document to

extract targeted categories (or fields) of data (e.g., data in the "number", "buyer" and "item" categories of the purchase order) from the XML document (Bata column 9, lines 6 to 14). Bata then takes the extracted data and uses this data to populate a table with columns matching each of the targeted fields (e.g., one column each for the "number", "buyer" and "item" categories) of the XML document (Bata, Fig. 8 and column 9, lines 15-31). This is not Applicant's approach and Applicant's invention may be distinguished on a variety of grounds.

Applicant's invention does not receive and parse XML documents and store the parsed data in a database. Instead, Applicant's invention creates mappings to methods of web services and encapsulates these mappings in proxy tables that are used to represent methods of web services (Applicant's specification, paragraphs [0128]-[0129]). In addition, Applicant's invention acts in response to an action initiated at the database system (e.g., a user query) which requests data available from a web service rather than in response to receipt of a document from an external source. With Applicant's invention, for example, a user may submit a query requesting a JOIN of data stored in the database system with data maintained by, and available from, a remote Web service such as an Enterprise Resource Planning application (Applicant's specification, paragraph [0064]). In response, Applicant's system automatically performs the appropriate steps to interact with the web service, obtain the requested data from the web service and perform relational operations on the data (Applicant's specification, paragraph [0063]). Significantly, the JOIN is performed on data retrieved from the web service as well as data stored in the database system (Applicant's specification, paragraph [0063]). Moreover, Applicant's approach does not require that the data from the remote service be persisted in the database system. This provides several advantages. One advantage is that Applicant's approach avoids cache invalidation issues. If data obtained from a remote service at various different times was persisted in the database, one could not be sure what data was current and correct. Another advantage is improved scalability. In addition, Applicant's approach enables the inherent security and auditing features provided in database systems to be extended to cover access to web services.

Rather than parsing XML documents and storing the parsed data in a database

system, Applicant provides for creating a proxy table to represent a method of a web service (Applicant's specification, paragraph [0063]). Creation of the proxy table does not require a pre-defined mapping; Applicant's invention creates the mapping to the method of the web service on-the-fly based on the interface definition of the Web service (Applicant's specification, paragraphs [0126]-[0127]). In addition, Applicant's system is not tied to particular XML or schema. Applicant's approach provides for generating the mapping when a proxy table is created to represent the Web service. These features are clearly indicated as limitations of Applicant's claims. For example, Applicant's claim 1 includes the following limitations:

> A method for performing database operations on data obtained from a web service, the method comprising:
> creating at least one proxy table in a database, each proxy table mapping to a method of the web service;

(Applicant's claim 1, emphasis added)

The Examiner references Bata at column 5, lines 31-34 and column 9, lines 6-34 for the corresponding teaching of creating a proxy table mapping to a method of the web service. However, the referenced portions of Bata make no mention of creating a proxy table to represent a remote service. Instead, Bata teaches parsing documents in XML format (e.g., a purchase order) and storing the parsed data extracted from the XML document in columns and rows of a database table based on a hard-coded, pre-defined mapping (i.e., the "number", "buyer" and "item" data categories which are the pre-defined target conversion fields in the example shown at column 9, lines 6-34 of Bata).

In Applicant's system the proxy table is not used to store parsed data extracted from a document, but rather is used to represent a method of the web service and interact with the web service to obtain data from the web service when called. In response to a database operation (e.g., database query) that requests data from the method of the web service represented by the proxy table, Applicant's invention automatically converts the database operation into the appropriate format to invoke the web service based on the mapping (Applicant's specification, paragraphs [0129]-[0130]). For example, when a SELECT statement on the proxy table is received, the SELECT statement is intercepted

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and turned into a call to invoke the web method represented by the proxy table (Applicant's specification, paragraph [0134]). These features are also clearly included as limitations of Applicant's claims. For example, Applicant's claim 1 includes the following claim limitations:

> in response to a database operation on a particular proxy table, converting the database operation into a format for invoking a particular method of the web service based upon the corresponding mapping;
> invoking the particular method of the web service;

(Applicant's claim 1, emphasis added)

The Examiner references Bata at column 7, lines 35-43 for the corresponding teaching of converting the database operation into a format for invoking a method of the web service. However, the referenced portion of Bata does not reference converting a database operation into a format for invoking a method of a web service. Instead, it provides for mapping data in an incoming purchase order received from an external source to fields in internal database systems as follows:

> The join shown in Diagram A creates a single document, which in the preferred embodiment is an XML document, representing the data needed to process a purchase order received from the trading partner. **This document can be used to map the data in an incoming purchase order to the appropriate fields in other systems such as the inventory management system and the purchase order database table.** This mapping can be done in a visual interface without writing any custom code, as is generally necessary.

(Bata, column 7, lines 35-43, emphasis added)

As illustrated above, Bata's system responds to incoming data received from an external system (e.g., incoming purchase order received from a trading partner). It makes no mention of a database operation or a proxy table. In addition, in Bata's system the conversion that is made is to map data in the incoming purchase order to fields of internal systems based on a pre-defined mapping. Applicant's claimed invention, in contrast, provides for converting the database operation into a format appropriate for invoking a

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method of the external web service. This is done so that the method of the web service can be invoked in order to obtain the data needed to perform the database operation which is maintained by the web service.

After the database operation is converted into the format for invoking the method of the web service, Applicant's system proceeds to invoke this method of the web service (Applicant's specification, paragraph [0137]). This includes converting data types of the input arguments to the types that the web method is expecting (Applicant's specification, paragraph [0139]) and making the actual call to the web method (Applicant's specification, paragraphs [0140]-[0141]). The Examiner again references Bata at column 10, lines 10-16 for the corresponding teaching. However, the referenced portions of Bata do not discuss invocation of a web service, but rather describe the conversion of table data into XML format.

All told, Bata provides no teachings of creating a proxy table to represent a web service or of invoking the web service in response to a database operation on this proxy table comparable to that described in Applicant's specification and claims. Instead, Bata focuses on converting static information in a document (e.g., a purchase order in XML format) into a format that can be stored in a database. Applicant's invention, in contrast, provides for dynamically interacting with and obtaining information available from a web service without requiring that the data be parsed and persisted in the database system. Significantly, Applicant's system enables a user to join relational data (e.g., data stored in the local database) with data obtained from a web service in response to an operation (e.g., database query submitted by a user) at the database system.

The Examiner also acknowledges that Bata does not teach performing a database operation on the data obtained from the web service at the database and references Omoigui for these teachings. Omoigui's system is focused on providing context and time-sensitive semantic information retrieval services to clients operating a presentation platform. Although Omoigui discusses operations performed by a semantic query processor, it does not cure any of the above-described deficiencies of Bata as to Applicant's invention. Applicant's review of Omoigui finds that it does provide any teaching of creating a proxy table to represent a web service in a database system nor

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does it teach invoking the web service in response to a database operation on this proxy table in the manner described in Applicant's specification and claims. Accordingly, as the prior art reference(s), even when combined, fail to teach or suggest all the claim limitations, it is respectfully submitted that Applicant's claimed invention as set forth by these claims is distinguishable over the two references, and that the rejection under Section 103 is overcome.

Any dependent claims not explicitly discussed are believed to be allowable by virtue of dependency from Applicant's independent claims, as discussed in detail above.

Conclusion

In view of the foregoing remarks and the amendment to the claims, it is believed that all claims are now in condition for allowance. Hence, it is respectfully requested that the application be passed to issue at an early date.

If for any reason the Examiner feels that a telephone conference would in any way expedite prosecution of the subject application, the Examiner is invited to telephone the undersigned at 408 884 1507.

Respectfully submitted,

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John A. Smart; Reg. No. 34,929
Attorney of Record

408 884 1507
815 572 8299 FAX

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